

CLAIMS

1. A substrate holding mechanism comprising:
a mounting flange;
5 a support member secured to said mounting flange; and
a retainer ring secured to said mounting flange and
arranged around an outer periphery of said support member;
wherein a substrate to be polished is held on a lower
side of said support member surrounded by said retainer
10 ring, and said substrate is pressed against a polishing
surface;
wherein said retainer ring is made of a polyimide
compound.
2. A substrate holding mechanism comprising:
15 a mounting flange;
a support member secured to said mounting flange; and
a retainer ring secured to said mounting flange and
arranged around an outer periphery of said support member;
wherein a substrate to be polished is held on a lower
20 side of said support member surrounded by said retainer
ring, and said substrate is pressed against a polishing
surface;
wherein said mounting flange is provided with a flow
passage contiguous with at least said retainer ring, and a
25 temperature-controlled gas is supplied through said flow
passage to cool said mounting flange, said support member
and said retainer ring.
3. A substrate holding mechanism according to claim 2,
wherein said retainer ring is provided with a plurality of
30 through-holes communicating with said flow passage to spray
the gas flowing through said flow passage onto the
polishing surface of a polishing table.

4. A substrate holding mechanism according to claim 3, further comprising switching means for selectively supplying a cooling gas and a retainer ring cleaning liquid to said flow passage.

5 5. A substrate holding mechanism according to any one of claims 2 to 4, wherein the temperature-controlled gas supplied through said flow passage is a moisted gas.

6. A substrate holding mechanism according to any one of claims 2 to 4, wherein a pressurizing chamber is provided
10 between said mounting flange and said support member, and a pressure fluid is supplied to said pressurizing chamber to press said support member, wherein a pressure of the gas supplied through said flow passage is lower than a pressure of the fluid supplied to said pressurizing chamber.

15 7. A substrate polishing apparatus comprising:
a substrate holding mechanism; and
a polishing table having a polishing surface;
wherein a substrate to be polished that is held by
said substrate holding mechanism is pressed against the
20 polishing surface of said polishing table, and said
substrate is polished by relative movement between said
substrate held by said substrate holding mechanism and the
polishing surface of said polishing table;

wherein said substrate holding mechanism is the one
25 that is claimed in any one of claims 1 to 4.

8. A substrate polishing apparatus comprising:
a substrate holding mechanism; and
a polishing table having a polishing surface;
wherein a substrate to be polished that is held by
30 said substrate holding mechanism is pressed against the
polishing surface of said polishing table, and said
substrate is polished by relative movement between said

substrate held by said substrate holding mechanism and the polishing surface of said polishing table;

wherein cooling means is provided for cooling the polishing surface of said polishing table and a substrate
5 holding part of said substrate holding mechanism.

9. A substrate polishing apparatus according to claim 8, wherein said cooling means includes a dome having an inlet port and an outlet port, said dome covering the polishing surface of said polishing table and the substrate holding
10 part of said substrate holding mechanism, so that the polishing surface of said polishing table and the substrate holding part of said substrate holding mechanism are cooled with a gas stream induced by locally evacuating an inside of said dome.

15 10. A substrate polishing apparatus according to claim 9, wherein said cooling means includes low-temperature gas supply means arranged so that a low-temperature gas can be supplied into said dome from said low-temperature gas supply means through said inlet port.

20 11. A substrate polishing apparatus according to claim 9 or 10, wherein said cooling means is arranged so that a neighborhood of a portion of the polishing surface of said polishing table at a side thereof where said polishing table moves relative to said substrate and the substrate
25 holding part of said substrate holding mechanism are placed within a flow path of a gas stream induced by said local evacuation.

12. A substrate polishing apparatus according to claim 11, wherein said cooling means includes a partition plate
30 provided in said dome to control a gas stream induced by said local evacuation so that a neighborhood of a portion of the polishing surface of said polishing table at a side

thereof where said polishing table moves relative to said substrate and the substrate holding part of said substrate holding mechanism are placed within a flow path of the gas stream induced by said local evacuation.

5 13. A substrate polishing apparatus according to claim 8, wherein said cooling means includes room-temperature gas supply means or low-temperature gas supply means to cool the polishing surface of said polishing table and the
10 substrate holding part of said substrate holding mechanism with a room-temperature gas from said room-temperature gas supply means or a low-temperature gas from said low-temperature gas supply means.

14. A substrate polishing apparatus according to claim 13, wherein said room-temperature gas supply means or said low-
15 temperature gas supply means is installed so as to cool a neighborhood of a portion of the polishing surface of said polishing table at a side thereof where said polishing table moves relative to said substrate.

15. A substrate polishing apparatus according to claim 8,
20 wherein said cooling means includes low-temperature gas supply means to cool said substrate being polished by supplying a low-temperature gas from said low-temperature gas supply means to a reverse side of said substrate.

16. A substrate polishing apparatus according to claim 15,
25 wherein said cooling means includes a fixed flow control valve for ensuring a predetermined flow velocity for the low-temperature gas supplied from said low-temperature gas supply means.

17. A substrate polishing apparatus according to claim 16,
30 wherein said fixed flow control valve is an opening-adjustable fixed flow control valve whose valve opening is adjustable.

18. A substrate polishing apparatus according to claim 15, further comprising, as means for transferring said substrate after polishing, a vacuum holding mechanism having evacuating means for evacuating the low-temperature
5 gas from a flow passage supplying the low-temperature gas to hold said substrate by sucking the low-temperature gas from said flow passage.

19. A substrate polishing apparatus according to claim 18, wherein a check valve is provided in piping where said
10 fixed flow control valve is installed.

20. A substrate polishing method wherein a substrate to be polished that is held by a substrate holding mechanism is pressed against a polishing surface of a polishing table, and while a polishing solution is being supplied onto said
15 polishing surface, said substrate is polished by relative movement between said substrate and said polishing surface, wherein a temperature of said substrate is maintained in a range of from 40°C to 65°C during polishing of said substrate.

20 21. A substrate polishing method wherein a substrate to be polished that is held by a substrate holding mechanism is pressed against a polishing surface of a polishing table, and while a polishing solution is being supplied onto said polishing surface, said substrate is polished by relative
25 movement between said substrate and said polishing surface,

wherein a temperature of the polishing surface of said polishing table and a temperature of said substrate are maintained in a range of from 40°C to 65°C during polishing of said substrate.

30 22. A substrate polishing method according to claim 20 or 21, wherein the polishing surface of said polishing table and a substrate holding part of said substrate holding

mechanism are covered with a dome having an inlet port and an outlet port, and the polishing surface of said polishing table and the substrate holding part of said substrate holding mechanism are cooled with a gas stream induced by locally evacuating an inside of said dome and with a low-temperature gas supplied from low-temperature gas supply means.

23. A substrate polishing method according to claim 22, wherein a neighborhood of a portion of the polishing surface of said polishing table at a side thereof where said polishing table moves relative to said substrate is placed within a flow path of a gas stream induced by said local evacuation to cool said polishing surface and the substrate holding part of said substrate holding mechanism.

24. A substrate polishing method according to claim 20 or 21, wherein the polishing surface of said polishing table and a substrate holding part of said substrate holding mechanism are cooled with a room-temperature gas from room-temperature gas supply means or a low-temperature gas from low-temperature gas supply means.

25. A substrate polishing method according to claim 24, wherein cooling of the polishing surface of said polishing table is effected by cooling a neighborhood of a portion of the polishing surface of said polishing table at a side thereof where said polishing table moves relative to said substrate.

26. A substrate polishing method according to claim 20 or 21, wherein a low-temperature gas is supplied to a reverse side of said substrate being polished from low-temperature gas supply means to cool said substrate.

27. A substrate polishing method according to claim 20 or 21, wherein said substrate to be polished is a substrate

having a thin film of wiring material formed over a primary layer, including a recess formed therein, and said substrate is polished to remove the wiring material, exclusive of the wiring material in said recess.